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THE  
ONTARIO WATER RESOURCES  
COMMISSION  
WATER POLLUTION SURVEY  
of the  
TOWN OF PERTH  
COUNTY OF LANARK

1966

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THE  
ONTARIO WATER RESOURCES  
COMMISSION

Report on a  
WATER POLLUTION SURVEY

of the  
TOWN OF PERTH

in the  
COUNTY OF LANARK

Division of Sanitary Engineering

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WATER POLLUTION SURVEY  
of the  
TOWN OF PERTH

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# WATER POLLUTION SURVEY

of the

## TOWN OF PERTH

### INTRODUCTION

A water pollution survey of the Town of Perth was performed by OWRC staff on October 27 and 28, 1965. Surveys of this type are made to locate any existing and potential source of surface-water pollution. Appropriate recommendations are made if conditions are revealed which exert adverse effects on water quality. Appended to the report is a map of the town showing the locations of sampling points utilized during this survey.

### INTERVIEWS WITH OFFICIALS

Discussions were held with the following municipal officials during this survey:

Mr. J. H. Mather, Clerk-Treasurer;  
Mr. J. D. Gardiner, Manager, Public Utilities  
Commission.

An unsuccessful attempt was made to contact Dr. A. C. Fowler, Medical Officer of Health for the town. Excellent assistance was provided by Mr. R. Thomas who operates the municipal sewage pumping station and the waste treatment facilities. Information was received from Mr. L. M. Erion, P. Eng., Proctor and Redfern, Consulting Engineers.

### TOWN OF PERTH

The Town of Perth is located in the southern part of the County of Lanark, approximately 40 miles south-west of Ottawa. Highway 43 terminates at Highway 7 in the northern part of the town. The assessed population of Perth in 1964 was 5,682. The area of the municipality is approximately 1,675 acres.

The Tay River flows in an easterly direction through Perth.

### TAY RIVER AT PERTH

The Tay River is fed by Christie Lake and flows in an easterly direction through the town to empty into Rideau Lake approximately eight miles downstream from Perth. At a point located approximately five miles downstream from Perth, a portion of the flow is diverted through the Tay Canal reaching Rideau Lake west of the mouth of the river. The Tay River and Canal provide a marine route for watercraft of moderate draught upstream to the turning basin located east of Gore Street in Perth. Reportedly, small boats can proceed upstream to the dam at the bathing area within the town. At the upstream limit of Perth, the Tay River receives the flows from Grant Creek which drains Pike Lake and pursues an easterly course almost parallel to the Tay River.

According to information received from municipal officials at Perth, the control works located upstream at Bob's Lake are manipulated to ensure that the maximum and minimum flows in the Tay River are 150 and 50 cubic feet per second, respectively.

## WATER USES

### Municipal

The Tay River is the source of Perth's municipal water supply.

The effluent from Perth's municipal sewage treatment works is discharged to the Tay River and Canal approximately one mile downstream from the municipality. Surface-water drainage and some untreated or inadequately treated sewage flows are discharged from municipal outlets to the river in Perth.

### Industrial

River water is not utilized for industrial purposes to any known extent in Perth.

### Recreational

A popular bathing area is located on the Tay River at the public park in the central part of the town.

## WATER SUPPLY

The municipal water purification plant was constructed during 1964 and is located near the north bank of the Tay River in the upstream part of the municipality. The water supply is drawn from the river through a 24-inch diameter intake pipe. The concrete intake conduit extends for approximately 640 feet from the watercourse to the intake well at the plant. The water is treated and disinfected by the following various processes:

coarse screening, fine screening, coagulation, settling, rapid sand filtration, pH control, taste control, pre- and post-chlorination, and fluoridation. The water purification plant was designed for a treatment capacity of 2.0 million gallons per day. Water storage of approximately 120,000 gallons is provided at the plant, and an elevated tank located in the distribution system has a capacity of approximately 618,883 gallons.

Water mains extend westward from Perth to the Lanark County Home for the Aged, and to a golf club located in the vicinity.

#### SURFACE WATER DRAINAGE

Municipal storm sewers and drainage courses conduct surface run-off flows to the Tay River. The town was served by combined sewers until recently, and a programme is being pursued now to divert surface water to municipal storm sewers which are being constructed. A new storm sewer has been constructed on Wilson Street and will conduct surface run-off flows to the Tay River just south of the junction of Wilson Street and Herriott Street. Similar flows now discharge to the river from a ditch extending from Sunset Boulevard to the watercourse downstream from the new water purification plant. An improved drainage course known locally as the "car-shop drain" has its origin beyond the municipality and discharges to the Tay River south of Harvey Street East.



## SEWAGE WORKS

Construction of sewage works to serve the Town of Perth was undertaken to abate pollution of the Tay River. The sewage works were utilized initially during the month of July 1964, and include the waste stabilization pond and two sewage pumping stations. The pond was designed for sewage flow from a population of 8,000 based on a daily flow of 135 gallons per capita.

According to information received during this survey, most of the town was served by combined sewers prior to the provision of sewage treatment facilities. Approximately 10 to 12 houses remain unsewered, and are located in the vicinity of North Street and Alma Street. All of the combined sewers reportedly contribute flows to the treatment facilities with the exception of a combined sewer which extends along Brock Street East and terminates with a submerged outfall in the Tay River. It was intimated that this sewage soon will be excluded from the watercourse. The Lanark County Home for the Aged is located west of the municipality and is served by the town's sewer system.

The combined sewage flows converge at a syphon sewer which extends under the river between Beckwith Street and Sherbrooke Street. Relief sewer overflows pertaining to the syphon are located as submerged outlets at the east side of Beckwith Street and at the west side of Sherbrooke Street. Reportedly,

overflows occur at the outlets only during periods of surface run-off. A relief overflow from the combined sewer system is located on the south bank of the Tay River between Gore Street and Drummond Street. A sewer outfall of doubtful identity is located on the south bank of the river at the end of Wilson Street South. It was not possible to determine definitely if the latter outlet is a relief overflow or an uncontrolled sewer outlet since, although flows were apparent during a period of surface run-off on October 28, 1965, a discharge of substantial volume was evident during a period devoid of surface run-off on December 3, 1965.

Sewage flows passing through the sewer syphon discharge through an interceptor sewer to the main sewage pumping station. From this point the flows are pumped through approximately 1,700 feet of 14-inch diameter cast-iron forcemain to the concrete gravity trunk sewer which extends to the waste stabilization pond.

#### Sewage Pumping Stations

Descriptions of the two sewage pumping stations and the pertinent overflow arrangements are provided as follows:

##### George Street Pumping Station

This unit is located near the junction of George Street and Alan Street in the northern part of the municipality, and was utilized prior to the construction of sewage treatment facilities. Reportedly, there is no overflow arrangement at this pumping station.

### Main Pumping Station

This pumping unit is located north of Cockburn Street near the west bank of the Tay River. It was constructed to deliver all of the sewage flows through the forcemain to the Scotch Line, from whence they flow by gravity sewer to the sewage lagoon. This prefabricated pumping station is equipped with screening facilities and has a relief overflow to the river. Although no overflow was evident on October 27, 1965, such was occurring on the next day following a light snowfall. Although the flows being pumped contained surface run-off from street catch basins, it was apparent that the volume of overflow at the pumping station was high.

### WASTE STABILIZATION POND

Perth's waste stabilization pond is located near the Tay River and Canal approximately one mile south-east of the town in the Township of North Elmsley.

The waste treatment facility has three cells with approximate areas of 26.0, 26.3 and 30.7 acres on ponds numbering one, two and three, respectively. The raw sewage enters a distribution chamber at the site. The cells can be regulated to operate in series or in parallel. The latter procedure was in use during this survey. Effluent works are provided at each of the cells and the flows are discharged to the Tay River and Canal.

Appended to this report in Table III are laboratory results pertaining to "grab" samples collected at Perth's waste stabilization pond during 1965.

### INDUSTRY

The principal industrial firms located in Perth are listed as follows:

| <u>Name of Firm</u>                                                                                  | <u>Production</u>       |
|------------------------------------------------------------------------------------------------------|-------------------------|
| Andrew Jergens Company Ltd.,<br>Herriott Street                                                      | Toiletries, soap        |
| Brown Shoe Company of Canada Ltd.,<br>Plant - Sunset Blvd.,<br>Office - Sherbrooke Street West       | Footwear                |
| Code Felt and Knitting Company Ltd.,<br>Felt Mill - Market Street<br>Knitting Mill - Herriott Street | Felt products, etc.     |
| Frontenac Paper Box Company Ltd.,<br>Herriott Street                                                 | Paper boxes             |
| G. A. Finlay, Slaughterhouse,<br>Dufferin Street (Hwy. 7)                                            | Slaughtering Livestock  |
| Henry K. Wampole and Company Ltd.,<br>Dufferin Street                                                | Pharmaceutical Products |
| International Silver Co. of Canada Ltd.,<br>Park Street                                              | Cutlery                 |
| Perth Dairy,<br>Harvey Street                                                                        | Dairy Products          |
| Tayside Textiles Ltd.,<br>Sherbrooke Street                                                          | Textile Products        |
| United Dairy and Poultry Co-op.,<br>(Land O'Lanark Creamery)                                         | Cream Receiving Station |
| Inaerco Limited<br>Dufferin Street                                                                   | Sheet Metal Work        |

Reportedly, most of the industrial firms are served by municipal sewers. Comments of concern to this survey are provided as follows:

The G. A. Finlay slaughterhouse is located west of Dufferin Street (Highway 7) opposite the western end of Wilson Street. Livestock is slaughtered at this plant on a limited basis. The wastewater resulting from this slaughtering operation apparently is discharged to a private sub-surface sewage disposal system.

It was not determined if the Inaerco Limited premises are served by municipal or private sewage disposal facilities. Reportedly, no industrial wastewater is produced by the plant's fabricating procedures.

Plating operations are performed at the International Silver Company of Canada Limited premises in Perth. The plant superintendent reported during this survey that preliminary waste treatment facilities would be provided to control the quality of the plant's discharge to the municipal sewer system. The industrial procedures at this manufacturing concern have been inspected by staff of the Division of Industrial Wastes, OWRC, and appropriate recommendations have been made.

Until recently, some industrial wastewater was discharged directly to the Tay River from the Tayside Textiles Limited plant. An official of the firm reported during this survey that all of the

plant wastewater is discharged to a municipal sewer. The firm has discontinued dyeing procedures on the premises.

The United Dairy and Poultry Co-op (Land O'Lanark Creamery) plant was not in operation during this survey.

The industrial firms which have not received comments in the foregoing passage are served by municipal sewers.

#### PRIVATE OUTFALLS

No private discharges to the Tay River and Canal in Perth were revealed during the survey.

#### MUNICIPAL REFUSE DISPOSAL SITE

The existing refuse disposal site is located east of the Tay River and north of the Scotch Line road near the downstream limit of Perth. This is a low-lying area. Although combustible refuse is burned, little attempt is made to cover the residue. During this survey, there was no flow in the ditch which extends along the north side of the Scotch Line road to the east bank of the river. Reportedly, the municipal officials propose to abandon the use of this site for refuse disposal purposes, and are considering the use of an area located east of the river and north of Craig Street (Highway 43). Adequate precautions should be taken to ensure that refuse disposal procedures will not result in the deterioration of surface and ground-water quality.

### SAMPLING PROCEDURE

Water samples were collected from the Tay River and Canal during this survey to determine the influence exerted thereon by any waste discharges in Perth. Additional samples were obtained from accessible outfalls to the river within the town. The pertinent laboratory results are appended to this report in Tables I and II, respectively. Table III is a tabulation of laboratory results pertaining to the municipal waste stabilization pond.

The following information with respect to weather conditions during this survey is of interest in interpreting the sample results:

| <u>Date</u><br><u>1965</u> | <u>General</u><br><u>Weather</u><br><u>Observations</u> | <u>Maximum</u><br><u>Atmospheric</u><br><u>Temperature</u> | <u>Precipitation</u>                              |
|----------------------------|---------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------|
| October 27                 | Clear with<br>cloudy intervals                          | Approx. 40°F                                               | None observed                                     |
| October 28                 | Mostly cloudy                                           | Approx. 40°F                                               | Light snowfall<br>during night of<br>Oct. 27 - 28 |

### INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to determine the quality of samples were: biochemical oxygen demand (BOD), solids, and nitrogen. Bacteriological examinations were performed to enumerate coliform organisms. Specific laboratory tests were performed on

samples collected from raw sewage at the waste stabilization pond on October 28, 1965, to evaluate the content of cyanide and alkalinity, as well as the intensity of pH. Appended to this report is a copy of the interpretation of the various laboratory tests utilized to determine the quality of stream and outfall samples.

With respect to the content of BOD and coliforms in surface water, the OWRC objective is that the following limits should not be exceeded:

BOD - 4 parts per million (ppm)  
Coliform content - 2,400 organisms per 100 millilitres (ml) of water.

The criteria suggested for evaluating free ammonia and total Kjeldahl nitrogen in surface water are as follows:

|                    |                     |
|--------------------|---------------------|
| Free ammonia - Low | - 0.015 to 0.03 ppm |
| Moderate           | - 0.03 to 0.10 ppm  |
| High               | - 0.10 or greater   |

Total Kjeldahl nitrogen - normal range of 0.1 to 0.5 ppm.

#### SAMPLE RESULTS

The laboratory results are shown in appendices to this report as follows:

Table I - Tay River at Perth

Table II - Outfalls to Tay River at Perth

Table III - Municipal Waste Stabilization Pond



Table I - Tay River at Perth

With respect to BOD, solids, and coliform organisms, the quality of the Tay River water was generally satisfactory within the Town of Perth. The free ammonia content was moderate and the total Kjeldahl nitrogen values were slightly in excess of the normal range.

Table II - Outfalls to Tay River at Perth

The laboratory results confirm the presence of sewage in the overflow from the main sewage pumping station, and in the discharge from the sewer (sample point number RT 74.50 R) which is located on the south bank of the Tay River at the end of Wilson Street South. It is assumed that the latter outfall is a relief overflow from the combined sewer system.

Satisfactory conditions were revealed in the flows in the "car-shop drain", as well as in the discharge from the municipal storm drainage system which has its outfall on the river-bank near Sunset Boulevard.

Table III - Municipal Waste Stabilization Pond

In terms of BOD and suspended solids removal, this sewage treatment facility was functioning with the efficiency anticipated. The concentration of coliform organisms varied in the effluents from the three cells, being high on some occasions and relatively low in some instances. Of significance is the high pH and the appreciable cyanide content in the raw sewage entering

the waste stabilization pond, especially when consideration is given to the fact that these flows are received from a system which is comprised principally of combined storm and sanitary sewers. The writer was informed during this survey that Perth has not enacted legislation to control the quality of waste being discharged to the combined sewer system. The banks of the river are marshy for a distance of several miles downstream from the lagoon site, thus indicating that riparian use of this section of the watercourse is not likely extensive.

#### SUMMARY

A water pollution survey of the Town of Perth was performed by OWRC staff on October 27 and 28, 1965. Investigations were made to obtain information concerning any discharges to the Tay River and Canal within the town, and to determine the quality of the watercourse.

Perth is served by a new municipal water purification plant which was constructed during 1964, and a waste stabilization pond which was placed in service during the same year. Since the municipality has utilized systems of combined sewers, a programme of constructing storm sewers has been commenced in order to segregate surface run-off from the existing combined sewers.

According to the information received during this survey, none of the industrial plants in Perth discharge wastewater

directly to the Tay River. The town has not enacted legislation to control the quality of sewage being discharged to the sewer system. Such control frequently is necessary to protect the sewers and pumping equipment, and to promote the efficiency of the sewage treatment facility.

Relocation of the municipal refuse disposal operation is being contemplated by the municipal officials.

The laboratory results pertaining to samples collected during this survey indicate that the quality of the water in the Tay River and Canal in Perth was generally satisfactory, although total Kjeldahl nitrogen values were slightly high. Sewage was discharging to the river from the main sewage pumping station and from a sewer outfall which presumably serves as a relief overflow.

#### RECOMMENDATIONS

1. Perth's storm sewer construction programme should be continued in order to exclude surface run-off flows from the existing combined sewers and thus reduce the volume of raw sewage which discharges from relief outlets in the sewer system.

2. The adoption and enforcement of an industrial waste by-law at Perth should be considered by the municipal officials in order to control the quality of sewage being discharged to the municipal sewers.

3. The selection of a new municipal refuse disposal site is desirable and should be undertaken with discretion. The method of operation should be such that refuse material will not impair the quality of surface or ground waters.

Approved by:   
L. G. South,  
Acting District Engineer,  
Division of Sanitary Engineering.

Prepared by: R. G. Barrens

/mh

## DESCRIPTION OF LABORATORY ANALYSES

### Biochemical Oxygen Demand

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposable organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported.

### Solids

The analyses for solids include tests for total, suspended and dissolved solids. The results are reported in ppm. The first test measures both the solids in solution and in suspension. The suspended solids value indicates the measure of undissolved solids of organic or inorganic nature in suspension. Significant sources of suspended solids are sewage, industrial wastes and land erosion. Suspended solids in water can present difficulties in water purification, and might result in deposits in streams which can interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

### Nitrogen

Nitrogen determinations were performed to evaluate the quality of the Tay River at three locations in Perth. Since it was anticipated that any pollution of the river within the town would be of recent origin, analyses were performed for free ammonia (ammonia nitrogen) and total Kjeldahl nitrogen which are the first two stages of the nitrogen cycle.

Free ammonia is the soluble material produced in the decomposition of nitrogenous organic matter. It is formed also when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia might be taken from the atmosphere by rainwater.

Total Kjeldahl nitrogen is a measure of the total nitrogen material present except that which is measured as nitrite and nitrate nitrogens. The total Kjeldahl nitrogen less the ammonia nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen values are important in determining the availability of nitrogen for biological utilization.

### Coliform Organisms

The coliform count is employed to enumerate the coliform organisms present in the sample. The presence of coliforms indicates pollution by human or animal excrement, or by some non-faecal forms. The membrane filter technique was used in the examination of these samples.

TABLE i  
TAY RIVER AT PERTH

| <u>SAMPLE<br/>POINT No.</u> | <u>DESCRIPTION</u>                                                        | <u>DATE OF<br/>SAMPLE</u> | <u>5-DAY<br/>BOD</u> | <u>S O L I D S</u> |              |              | <u>NITROGEN</u>         | <u>AS N</u>               | <u>BACTERIOLOGICAL</u>   |
|-----------------------------|---------------------------------------------------------------------------|---------------------------|----------------------|--------------------|--------------|--------------|-------------------------|---------------------------|--------------------------|
|                             |                                                                           |                           |                      | <u>TOTAL</u>       | <u>SUSP.</u> | <u>DISS.</u> | <u>FREE<br/>AMMONIA</u> | <u>TOTAL<br/>KJELDAHL</u> | <u>COLIFORMS/100 ML.</u> |
| RT 75.23                    | TAY RIVER AT MUNICIPAL WATER WORKS INTAKE<br>NEAR UPSTREAM LIMIT OF PERTH | OCT. 27                   | 3.7                  | 146                | 2            | 144          | --                      | --                        | 180                      |
| RT 74.87                    | TAY RIVER AT PETER ST. (BRIDGE LEADING TO<br>GOLF COURSE)                 | OCT. 27                   | 2.0                  | 188                | 2            | 186          | --                      | --                        | 120                      |
| RT 74.70                    | TAY RIVER AT MARKET ST. BRIDGE                                            | OCT. 27                   | 2.2                  | 140                | 2            | 138          | TR.                     | 0.46                      | 180                      |
|                             |                                                                           | OCT. 28                   | 1.3                  | 126                | 2            | 124          | TR.                     | 0.71                      | 30                       |
| RT 74.29                    | TAY RIVER AT BECKWITH STREET                                              | OCT. 27                   | 2.3                  | 154                | 2            | 152          | TR.                     | 0.46                      | 680                      |
| RT 73.70                    | TAY RIVER AT SCOTCH LINE ROAD (DOWNSTREAM<br>LIMIT OF PERTH)              | OCT. 27                   | 2.3                  | 162                | 2            | 160          | 0.05                    | 0.80                      | 720                      |
|                             |                                                                           | OCT. 28                   | 1.4                  | 124                | 1            | 123          | 0.05                    | 0.78                      | 320                      |

NOTE: ALL ANALYSES EXCEPT OTHERWISE INDICATED ARE REPORTED IN PPM.

TABLE II  
OUTFALLS TO TAY RIVER IN PERTH

| <u>SAMPLE<br/>POINT NO.</u> | <u>DESCRIPTION</u>                                                                               | <u>DATE OF<br/>SAMPLE<br/>1965</u> | <u>5-DAY<br/>BOD</u>                     | <u>S O L I D S</u> |              |              | <u>BACTERIOLOGICAL<br/>EXAMINATION<br/>COLIFORMS/100 ML<br/>(M.F.)</u> |
|-----------------------------|--------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------|--------------------|--------------|--------------|------------------------------------------------------------------------|
|                             |                                                                                                  |                                    |                                          | <u>TOTAL</u>       | <u>SUSP.</u> | <u>DISS.</u> |                                                                        |
| RT 73.70 D                  | DITCH TERMINATING ON NORTH BANK OF TAY RIVER AT SCOTCH LINE - WEST SIDE OF ROAD                  | ---                                | NO FLOW DURING SURVEY                    |                    |              |              | ----                                                                   |
| RT 73.96 R                  | OVERFLOW FROM MUNICIPAL SEWAGE PUMPING STATION TO TAY RIVER                                      | OCT. 28                            | 38.0                                     | 540                | 60           | 480          | 11,000,000                                                             |
| RT 74.02 C                  | COMBINED SEWER OUTFALL AT NORTH BANK OF TAY RIVER AT BROCK ST. (SUBMERGED OUTLET)                |                                    | NOT ACCESSIBLE FOR SAMPLING              |                    |              |              | ----                                                                   |
| RT 74.13 D                  | IMPROVED DRAINAGE COURSE - "CAR-SHOP DRAIN" - DISCHARGING TO TAY RIVER NEAR HARVEY STREET        | OCT. 27                            | 2.6                                      | 436                | 4            | 432          | 210                                                                    |
| RT 74.40 R                  | OVERFLOW FROM SEWER SYSTEM - SOUTH BANK OF RIVER BETWEEN GORE ST. AND DRUMMOND STREET.           | OCT. 27                            | NO FLOW                                  |                    |              |              | ----                                                                   |
| RT 74.50 R                  | OVERFLOW FROM COMBINED SEWER SYSTEM ON SOUTH BANK OF TAY RIVER AT END OF WILSON STREET SOUTH     | OCT. 28                            | 19.0                                     | 392                | 20           | 372          | 33,000,000                                                             |
| RT 74.53 W                  | MUNICIPAL STORM SEWER OUTLET ON NORTH BANK OF TAY RIVER DIVERSION AT FOOT OF WILSON STREET NORTH |                                    | NO FLOW - SEWER OUTLET BEING CONSTRUCTED |                    |              |              | ----                                                                   |
| RT 75.24 D                  | DITCH FLOWING UNDER SUNSET BLVD. TO RIVER JUST DOWNSTREAM FROM MUNICIPAL WATER WORKS             | OCT. 27                            | 2.4                                      | 748                | 4            | 744          | 130                                                                    |

NOTE: ALL ANALYSES EXCEPT OTHERWISE INDICATED ARE REPORTED IN PPM.



TABLE III  
MUNICIPAL WASTE STABILIZATION POND

| DATE<br>1965                                | RAW SEWAGE |              |      |                   |                                    | POND EFFLUENTS     |                 |                                          |
|---------------------------------------------|------------|--------------|------|-------------------|------------------------------------|--------------------|-----------------|------------------------------------------|
|                                             | BOD        | SUSP. SOLIDS | PH   | CYANIDE<br>AS HCN | ALKALINITY<br>AS CaCO <sub>3</sub> | BOD                | SUSP.<br>SOLIDS | COLIFORMS PER 100 ML.<br>MEMBRANE FILTER |
| JAN. 21                                     | 98         | 97           |      |                   |                                    | 19<br>11<br>21     | 24<br>21<br>16  |                                          |
| FEB. 23                                     | 660        | 320          |      |                   |                                    | 58<br>82<br>76     | 20<br>22<br>17  |                                          |
| MAR. 23                                     | 52         | 70           |      |                   |                                    | 51<br>24<br>55     | 23<br>31<br>22  |                                          |
| APR. 27                                     | 390        | 174          |      |                   |                                    | 19<br>14<br>17     | 18<br>26<br>23  |                                          |
| MAY 25                                      | 180        | 308          |      |                   |                                    | 5.8<br>11.0<br>5.2 | 9<br>12<br>2    | 300<br>400<br>1,800                      |
| JUNE 29                                     | 48         | 59           |      |                   |                                    | 6.4<br>6.4<br>12   | 12<br>7<br>7    |                                          |
| JULY 27                                     | 70         | 68           |      |                   |                                    | 13<br>28<br>6.4    | 57<br>69<br>19  |                                          |
| AUG. 30                                     | 150        | 184          |      |                   |                                    | 13<br>5.8<br>7.8   | 22<br>30<br>7.6 |                                          |
| SEPT. 28                                    | 49         | 83           |      |                   |                                    | 6.4<br>4.4<br>4.0  | 20<br>1<br>13   | 150,000<br>140,000<br>1,400              |
| OCT. 26                                     | 31         | 56           |      |                   |                                    | 6.4<br>5.8<br>8.0  | 18<br>9<br>14   | 4,600<br>2,300<br>150                    |
| OCT. 28<br>(OWRC WATER<br>POLLUTION SURVEY) | 1180       | 354          | 11.2 | 0.5               | 590                                | 3.4<br>3.4<br>3.4  | 10<br>4<br>6    | 2,800<br>2,800<br>800                    |
| NOV. 30                                     | --         | --           |      |                   |                                    | 3.8<br>3.0<br>4.0  | 32<br>15<br>11  | 66,000<br>13,000<br>45,000               |

NOTE: ALL RESULTS EXCEPT PH AND COLIFORMS REPORTED IN PARTS PER MILLION.



